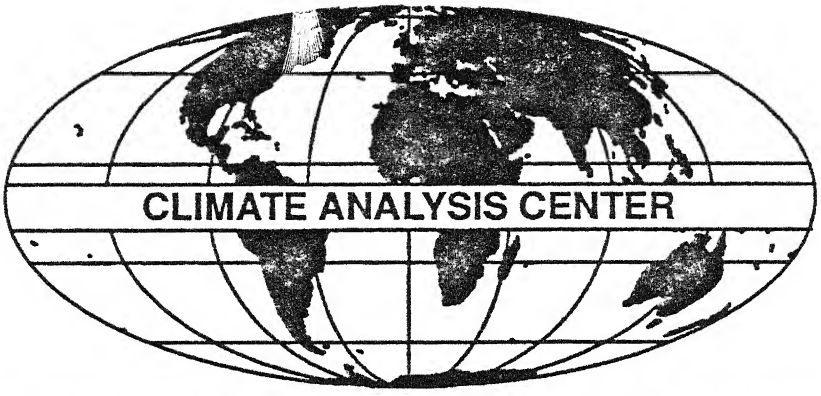
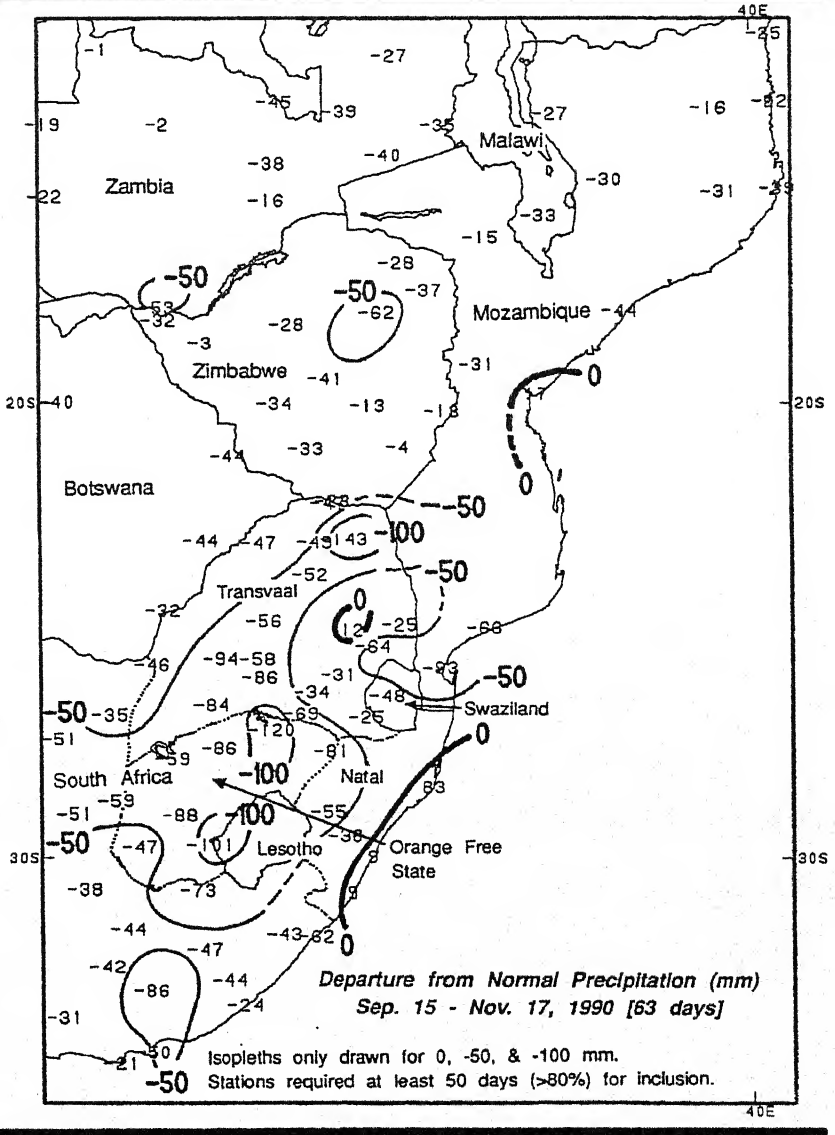


CONTAINS:
EL NIÑO
SOUTHERN
OSCILLATION
ADVISORY 90/9

WEEKLY CLIMATE BULLETIN

No. 90/46 **Washington, DC** **November 17, 1990**

In southern Africa, the rainy season normally commences during the spring months (September – November) and reaches a maximum during the summer (December – February). So far this year, however, the rains have been slow to start, and most locations have measured less than half the usual rainfall since mid–September. Accumulated deficits have exceeded 50 mm, particularly in South Africa's Orange Free State and central Transvaal, where the dryness has delayed maize planting by a month, according to South Africa's agricultural officials.



UNITED STATES DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL WEATHER SERVICE–NATIONAL METEOROLOGICAL CENTER
CLIMATE ANALYSIS CENTER

WEEKLY CLIMATE BULLETIN

This Bulletin is issued weekly by the Climate Analysis Center and is designed to indicate, in a brief concise format, current surface climatic conditions in the United States and around the world. The Bulletin contains:

- *Highlights of major climatic events and anomalies.*
- *U.S. climatic conditions for the previous week.*
- *U.S. apparent temperatures (summer) or wind chill (winter).*
- *U.S. cooling degree days (summer) or heating degree days (winter).*
- *Global two–week temperature anomalies.*
- *Global four–week precipitation anomalies.*
- *Global monthly temperature and precipitation anomalies.*
- *Global three–month precipitation anomalies (once a month).*
- *Global twelve–month precipitation anomalies (every three months).*
- *Global three–month temperature anomalies for winter and summer seasons.*
- *Special climate summaries, explanations, etc. (as appropriate).*

Most analyses contained in this Bulletin are based on preliminary, unchecked data received at the Climate Analysis Center via the Global Telecommunications System. Similar analyses based on final, checked data are likely to differ to some extent from those presented here.

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GLOBAL CLIMATE HIGHLIGHTS

MAJOR CLIMATIC EVENTS AND ANOMALIES AS OF NOVEMBER 17, 1990

1. Alaska and Northwestern Canada:

FIRST BITTERLY COLD OUTBREAK OF SEASON.

Frigid Arctic air has become entrenched across the region during the past two weeks. Weekly departures of –5°C to –10°C were observed throughout the region, and isolated locations in the Yukon were as much as 18°C below normal. Gusty winds dropped wind chills to –60°C in Alaska while daily temperatures averaged as much as 27°C below normal [2 weeks].

2. Western British Columbia and Extreme Northwestern U.S.:

HEAVY PRECIPITATION POUNDS REGION FOR SEVENTH CONSECUTIVE WEEK.

Since the end of September, as much as 1047 mm of rain has been reported across the region. Washington's Cascade Mountains have probably received even more, but data are unavailable. Although 35 – 160 mm were measured last week, river levels actually receded since the precipitation fell primarily as snow at all but the lowest elevations, dramatically reducing runoff. Since early October, as much as 202 mm of surplus precipitation has fallen in parts of British Columbia [7 weeks].

3. Central South America:

WARM AND WET WEATHER PREDOMINATES AS GROWING SEASON COMMENCES.

Torrential rains, up to 320 mm since late October, has fallen across extreme southern Brazil, Uruguay, southern Paraguay, and portions of northern Argentina. Numerous rivers and farmland plots have been flooded, according to press reports, particularly in southern Brazil. Another 60–150 mm fell across the region last week, bringing six–week precipitation surpluses up to 293 mm in isolated parts of Uruguay [Wet – 3 weeks]. In addition, periods of exceptionally warm weather have persisted since late September, with weekly departures of +3°C to +7°C [7 weeks].

4. South–Central Europe and North–Central Africa:

TEMPERATURES RETURN TO SEASONABLE LEVELS.

Near normal temperatures were measured, although weekly departures ranged between +3°C and +7°C just to the north across northern continental Europe [Ended after 9 weeks].

5. Central and Western Sahel:

ABNORMALLY WARM WEATHER CONTINUES.

Weekly temperature departures remained around +2°C [14 weeks].

6. Southeastern Africa

LIGHT RAIN BRINGS LIMITED RELIEF TO DRYNESS.

Most locations reported light rain (10–30 mm), with slightly higher totals (30–65mm) across extreme east–central South Africa and central Zimbabwe (see front cover) [7 weeks].

7. Japan:

DRIER WEATHER PREVAILS, BUT ABNORMAL WARMTH PERSISTS.

Little or no rain fell across most of Japan. Only portions of central and northwestern Honshu (30–60 mm) and southern and western Hokkaido (20–40 mm) reported significant precipitation [Ending after 9 weeks]. The recent warm spell, however, continued as temperatures averaged 2°C to 4°C above normal [Warm – 14 weeks].

8. Southeast Asia and The Philippines:

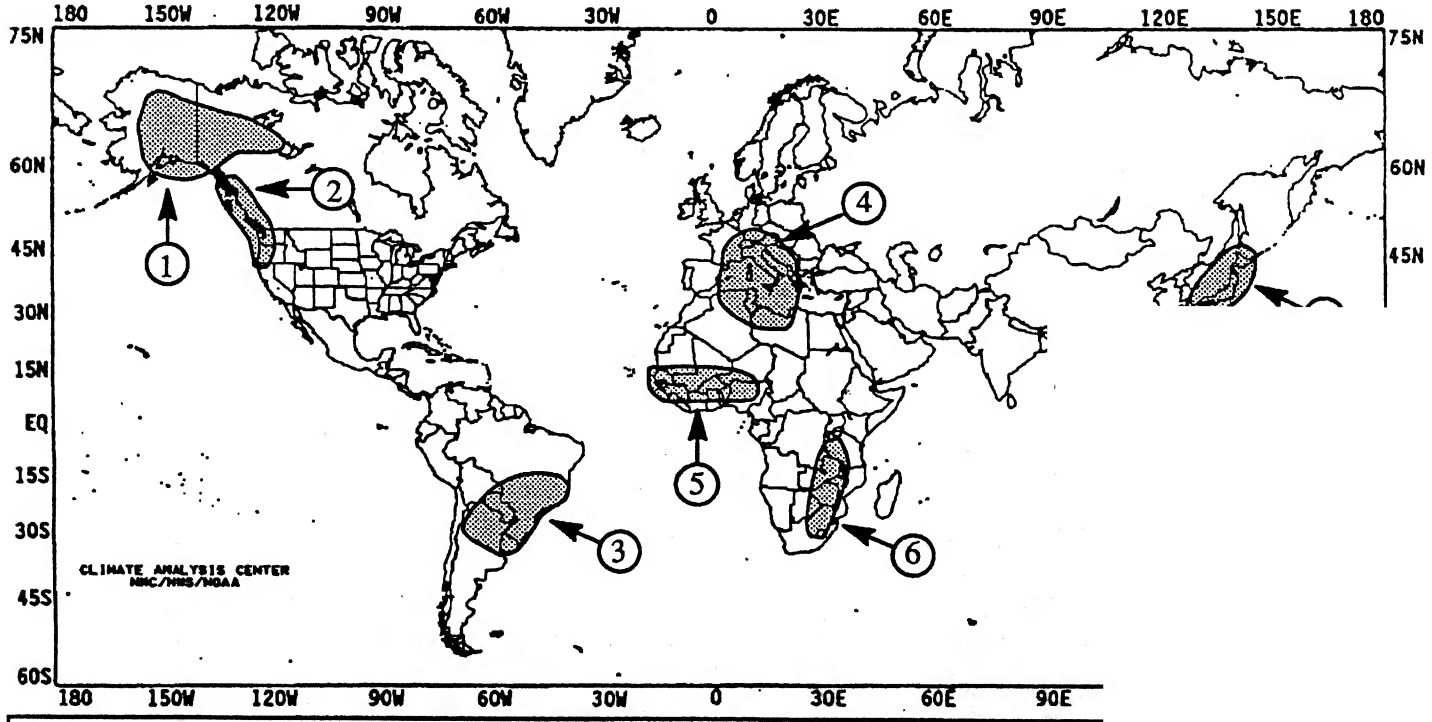
TWO TROPICAL CYCLONES BRING STRONG WINDS, HEAVY RAIN, FLOODS.

Super Typhoon Mike, the strongest storm to hit the Philippines in a decade, marched through the islands packing winds gusting over 200 kph. The storm dumped 75–175 mm across the central three–fourths of the country, leaving many thousands homeless and taking nearly 200 lives, according to press reports. Almost 200 additional persons are missing and presumed drowned as daily rainfall amounts up to 141 mm combined with a storm surge a few meters high to produce widespread coastal and lowland flooding. Farther west, Tropical Storm Nell quickly developed and made landfall near central Vietnam, then a weakened Mike brushed the central Vietnamese coast before turning northward and dissipating over Hainan Island. These two systems combined to dump 200–350 mm of rain on east–central Vietnam while the disintegrating Mike dropped 100–200 mm across central and eastern Hainan. Daily totals reached 150 mm along the Vietnamese coast, where widespread flooding was reported [Episodic Event].

9. Southeastern Australia:

REGION REMAINS WARM AND EXCESSIVELY DRY.

Little or no rain fell as moisture deficits increased [Dry – 6 weeks]. Near seasonable temperatures were recorded across New South Wales, Victoria, and Tasmania, but the remainder of the eastern half of the continent observed weekly departures of +1°C to +3°C [Warm – 4 weeks].



EXPLANATION

TEXT: Approximate duration of anomalies is in brackets. Precipitation amounts and temperature departur

MAP: Approximate locations of major anomalies and episodic events are shown. See other maps in this E temperature anomalies, four week precipitation anomalies, long–term anomalies, and other details.

UNITED STATES WEEKLY CLIMATE HIGHLIGHTS

FOR THE WEEK OF NOVEMBER 11 – 17, 1990

Record–breaking warmth and dry conditions highlighted the second week of of November. Much of the nation experienced Indian Summer weather as record highs were reported from California to Maine. Southerly winds pushed daily average temperatures up to 30°F above normal in parts of the northern and central Plains where readings soared into the seventies. Helena, MT reported a record high of 72°F on Sunday which was 28°F above normal. Tucson, AZ recorded their fourth record high temperatures of the week when the mercury reached 87°F on Friday, which was also the warmest for so late in the season. In sharp contrast, parts of Alaska were battered by blizzard conditions for the second time in as many weeks. Wind chills of –50°F and lower were reported across the northwestern part of the state as a major winter storm moved northward from the Bering Sea into the region. In the western Aleutians, winds gusted up to 113 mph at Shemya. Most of the contiguous United States remained predominantly dry during the week with exception of the Northeast and Pacific Northwest. Western Washington was under flood warnings until mid–week as swollen rivers remained several feet above the flood stage from last week's copious rainfall. Damage estimates were placed in the millions of dollars. Heavy rains also pounded parts of Hawaii where up to 8 inches of rain fell over a 24–hour period, causing flooding near Hilo.

The first half of the week featured an intense low pressure system off the Northeast coast. The associated front extended across the mid–Atlantic westward to the northern Plains. The storm generated high winds and heavy snow across portions of New England. Two feet of snow fell near Newport, VT, and gusts exceeded 60 mph across parts of New York, producing sub–zero wind chills across the western part of the state. Cold Canadian air behind the front pushed southward into the mid–Atlantic. In sharp contrast, warm and relatively dry weather was observed across the rest of the nation with the exception of the Pacific Northwest, where a cold front generated showers. High pressure located over the Great Basin sent temperatures into the eighties in California while chinook winds across the northern Rockies and northern and central Plains pushed readings into the seventies. Numerous record highs were reported from California to Oklahoma.

During the second half of the week, a brief warming trend took place across the eastern U.S. while a cooling trend commenced in the western half of the nation. The warm air in the West rapidly moved to the East Coast by Friday, producing record high temperatures from the middle Mississippi Valley to southern Maine. Portland, ME broke a 30– year old record when the high reached 68°F on Friday. Temperatures soared into the sixties and seventies across much of New England, but the warmth was short–lived as the cold front in the West tracked rapidly eastward and was off the East Coast by Saturday. Meanwhile, temperatures across the West lowered to more seasonable levels. Most of the nation remained dry during the latter half of the week. Showers were reported across portions of the eastern Ohio Valley and Appalachians on Saturday as an upper–level disturbance moved across the region. Elsewhere, a major storm system moved through the Bering Sea, bringing heavy snow and extremely strong winds to much of western Alaska.

According to the River Forecast Centers, the greatest precipitation (more than an inch) fell along the northern half of the Pacific Coast, on southern Alaska, and across much of Hawaii (Table 1). Light to moderate amounts were observed across most of the Northeast, eastern Ohio and Tennessee Valleys, and parts of the central and northern Rockies. Little or no precipitation was reported across the remainder of the country from the Intermountain West eastward to the Mississippi River, southern California, and the Southeast as high pressure dominated much of this area during the week.

Unseasonably warm air prevailed across the western two–thirds of the nation with the exception of the central Pacific Coast. Weekly temperature departures of +12°F to +16°F were observed across parts of the northern and central Rockies where highs were 20–30°F above normal early in the week (Table 2). Departures of +8°F to +12°F were common from the northern Plains to the middle Mississippi Valley. Warm weather early in the week in the West combined with a brief warm–up towards the week's end in the East, producing readings in the seventies across much of the country (Figure 1).

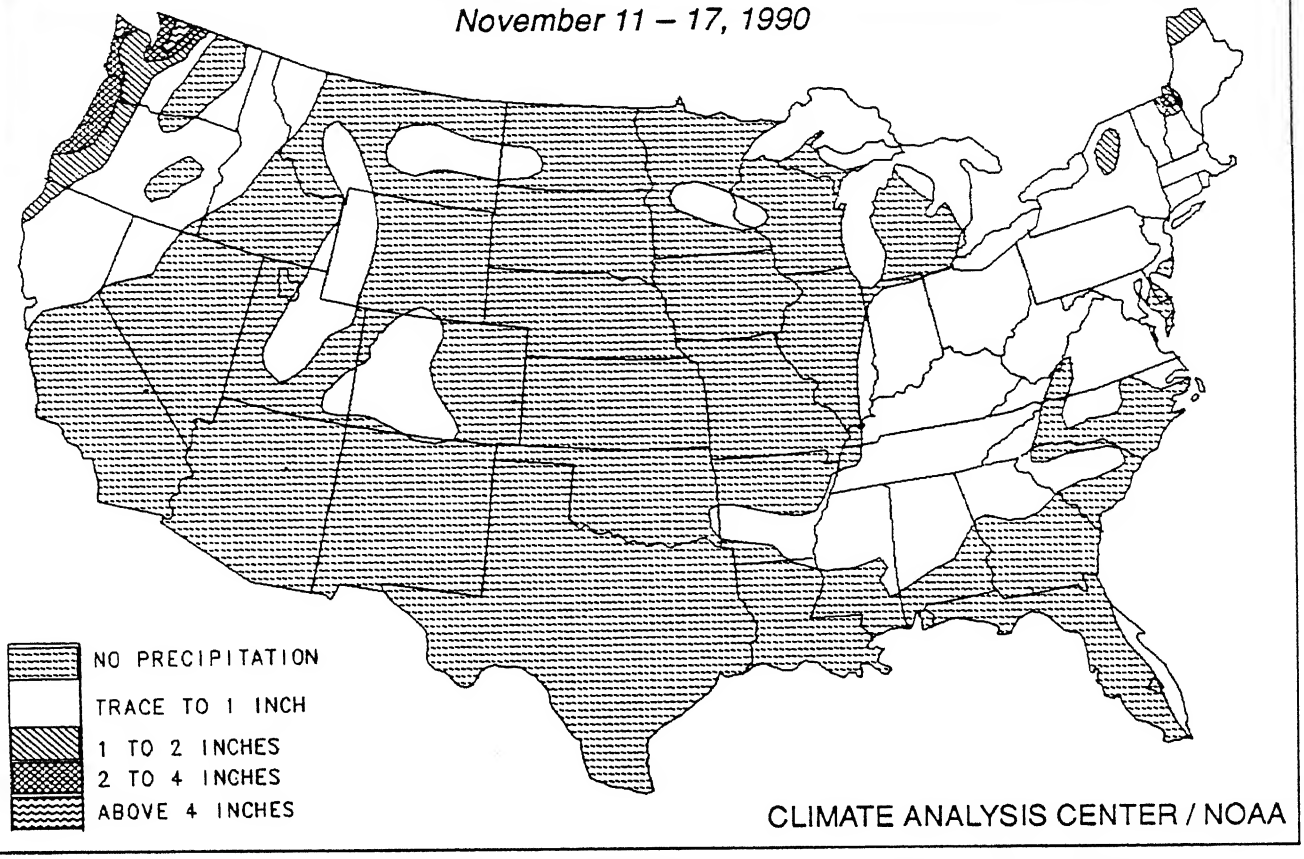
In contrast, temperatures averaged up to 4°F below normal in the Northeast despite record warmth on Friday. Cold air entrenched in the region early in the week and a reinforcing shot on Saturday were significant enough to keep weekly temperatures below normal. Farther north, central Alaska observed the second consecutive week of well below normal temperatures. Temperatures departures of –10°F were reported at a few locations (Table 3), and readings plummeted as low as –47°F at Northway on November 13.

TABLE 1. Selected stations with 2.00 or more inches of precipitation for the week.

STATION	TOTAL (INCHES)	STATION	TOTAL (INCHES)
HILO/LYMAN, HAWAII, HI	10.35	KOKEE, KAUAI, HI	2.61
QUILLAYUTE, WA	5.28	SITKA, AK	2.39
LIHUE, KAUAI, HI	5.18	TACOMA/MCCHORD AFB, WA	2.30
MT. WASHINGTON, NH	5.17	OLYMPIA, WA	2.17
NORTH BEND, OR	3.08	TACOMA/FT. LEWIS/GRAY AFB, WA	2.10
STAMPEDE PASS, WA	2.89	ADAK, AK	2.02
EUGENE, OR	2.81		

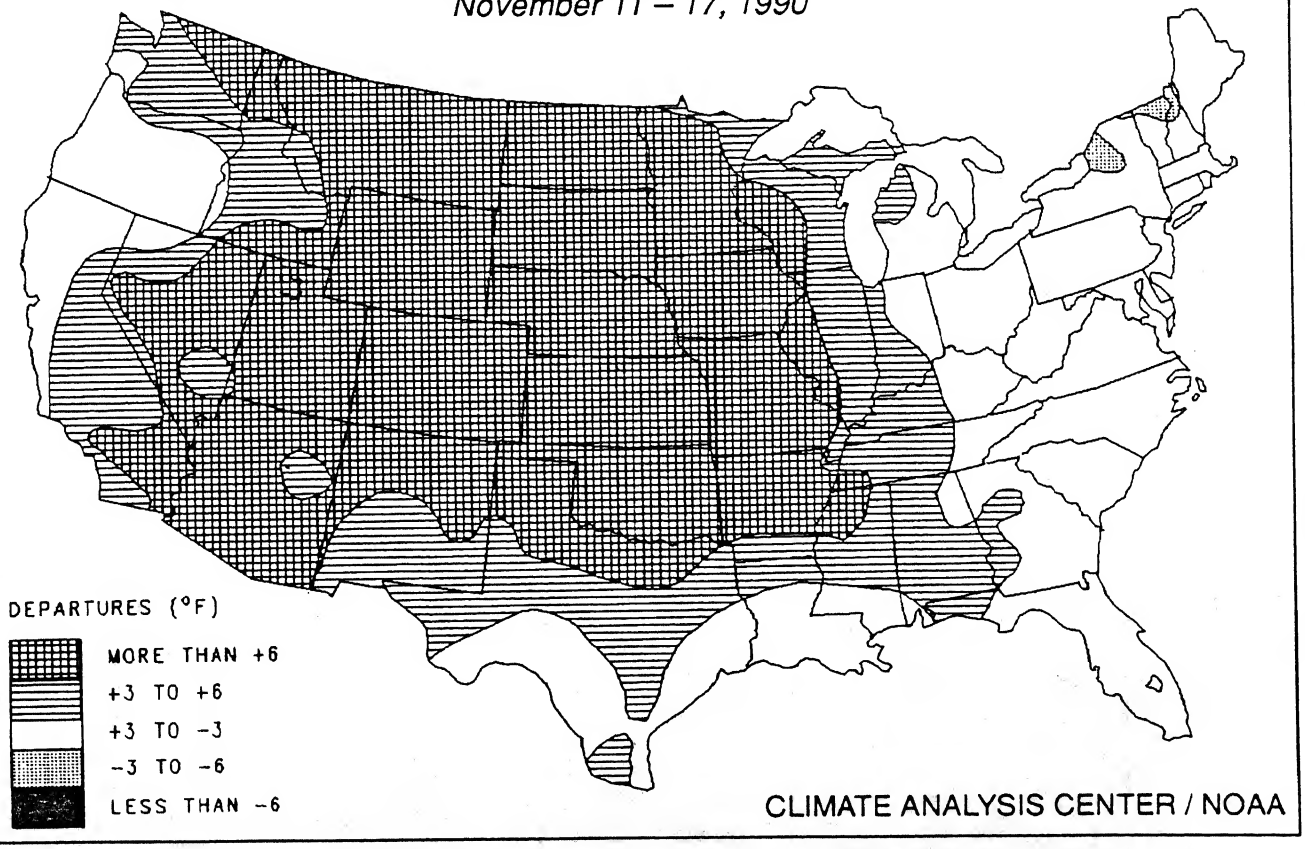
OBSERVED PRECIPITATION

November 11 – 17, 1990



DEPARTURE OF AVERAGE TEMPERATURE FROM NORMAL (°F)

November 11 – 17, 1990



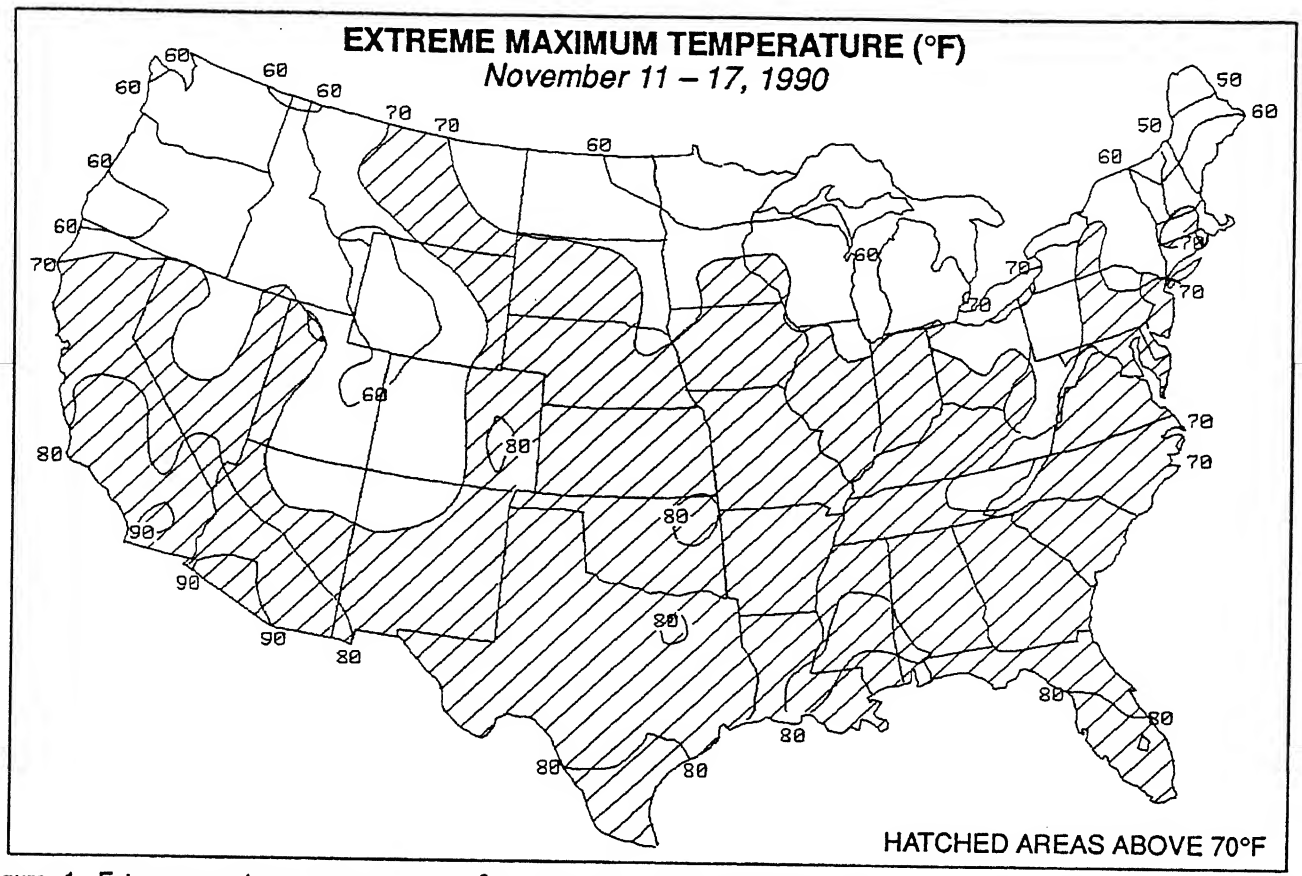


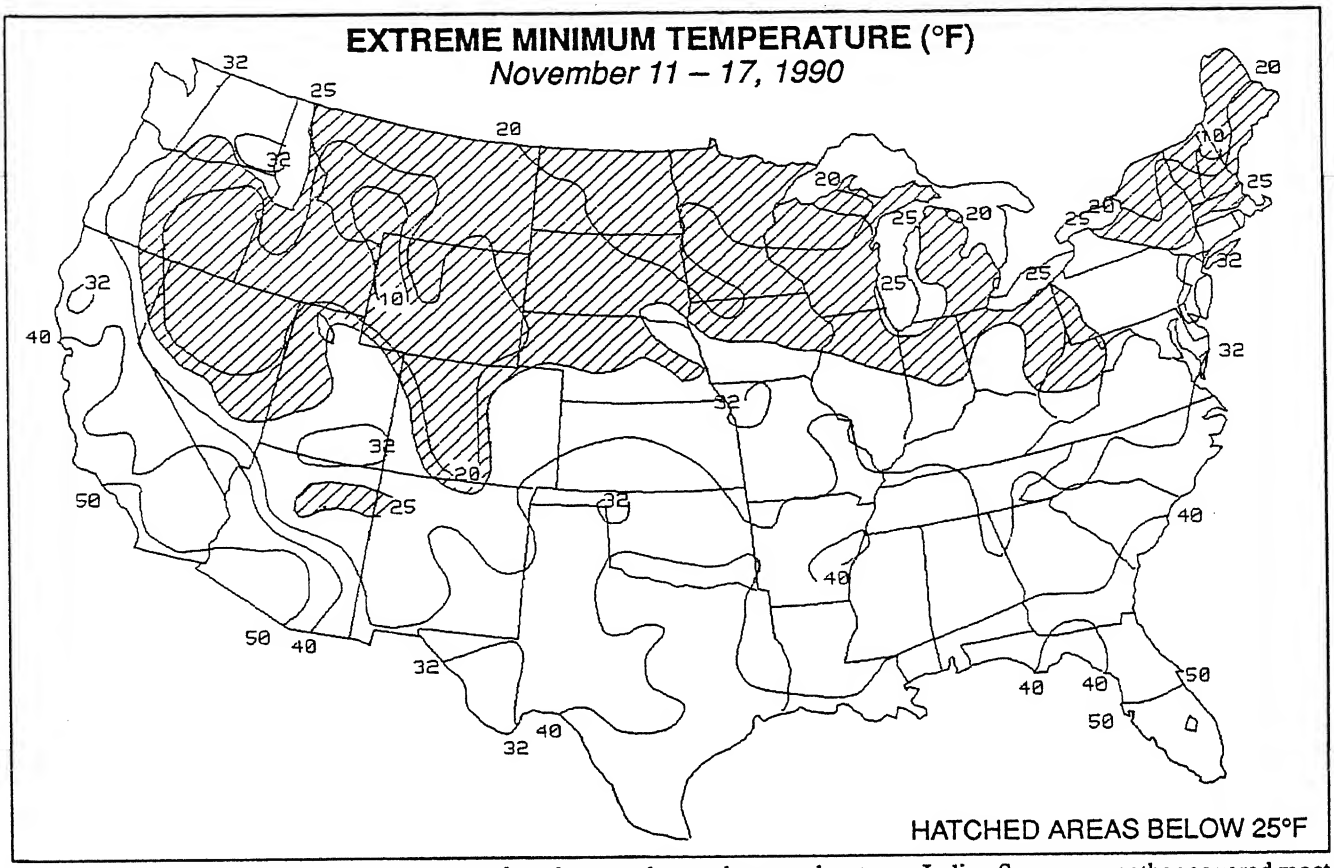
Figure 1. Extreme maximum temperatures (°F) during the week of November 11-17, 1990. Indian Summer weather covered much of the western two-thirds of the country during the first half of the week, sending temperatures into the seventies even into Montana. The warm air gradually pushed eastward by the week's end, briefly generating highs in the seventies as far north as central New England.

TABLE 2. Selected stations with temperatures averaging 11.0°F or more ABOVE normal for the week.

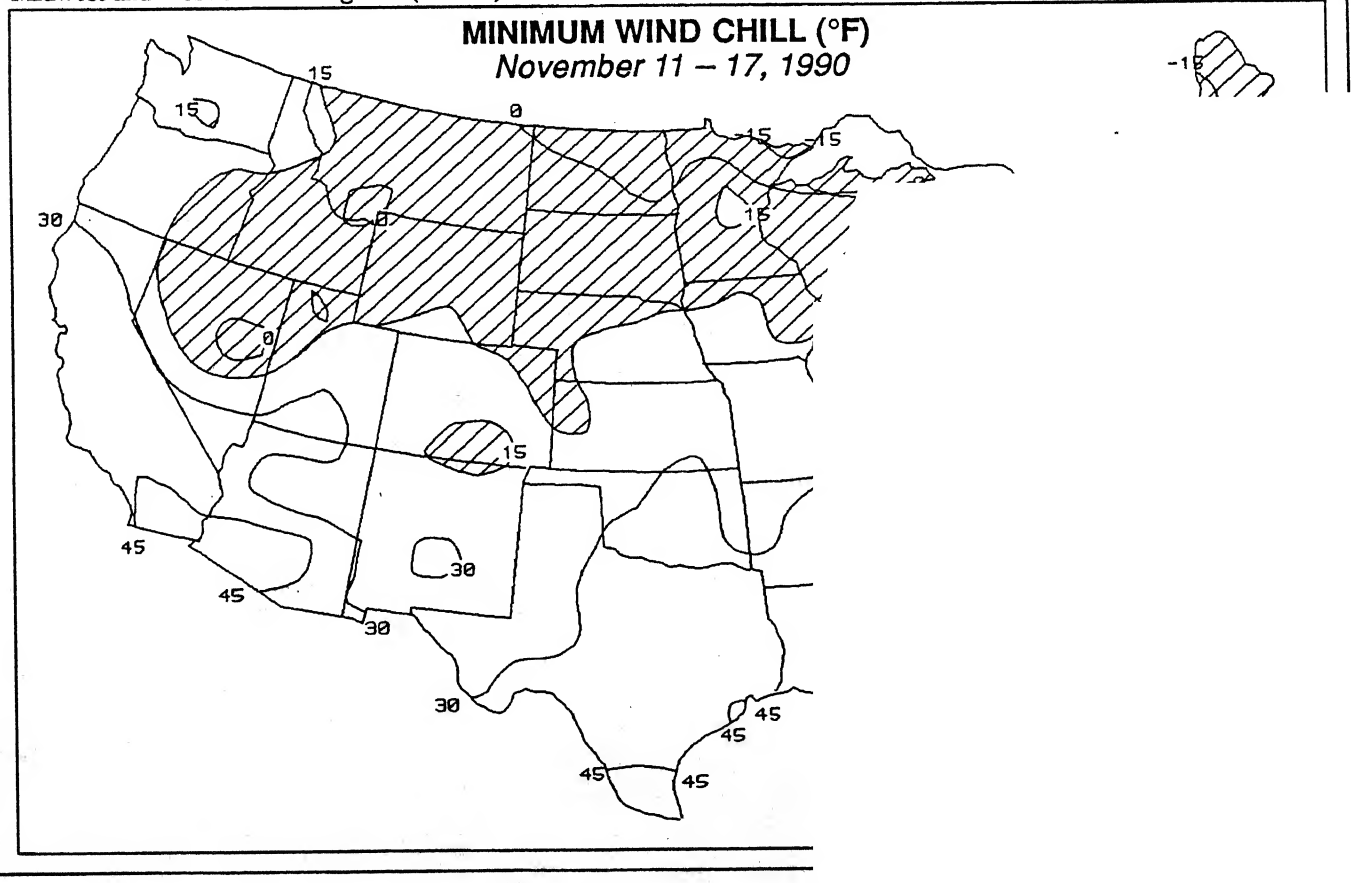
STATION	DEPARTURE (°F)	AVERAGE (°F)	STATION	DEPARTURE (°F)	AVERAGE (°F)
LEWISTOWN, MT	+16.1	48.1	CASPER, WY	+13.0	46.2
CUT BANK, MT	+15.2	44.8	GOODLAND, KS	+12.8	51.2
GREAT FALLS, MT	+14.7	49.3	PHOENIX, AZ	+12.7	73.7
RAPID CITY, SD	+14.6	49.8	DODGE CITY, KS	+12.7	55.4
AKRON, CO	+14.4	50.8	GARDEN CITY, KS	+12.4	53.9
BILLINGS, MT	+14.1	49.4	MILES CITY, MT	+12.1	44.5
DENVER, CO	+13.9	52.8	GRAND ISLAND, NE	+12.0	50.1
CHEYENNE, WY	+13.7	48.6	CONCORDIA, KS	+11.9	53.7
VALENTINE, NE	+13.7	48.1	RUSSELL, KS	+11.8	53.8
LARAMIE, WY	+13.5	43.0	TUCSON/DAVIS-MONTHAN AFB, AZ	+11.7	69.9
SHERIDAN, WY	+13.3	46.1	HAVRE, MT	+11.2	42.3
COLORADO SPRINGS, CO	+13.1	50.7	SALINA, KS	+11.1	54.4
NORTH PLATTE, NE	+13.0	48.4	ELY, NV	+11.1	45.2

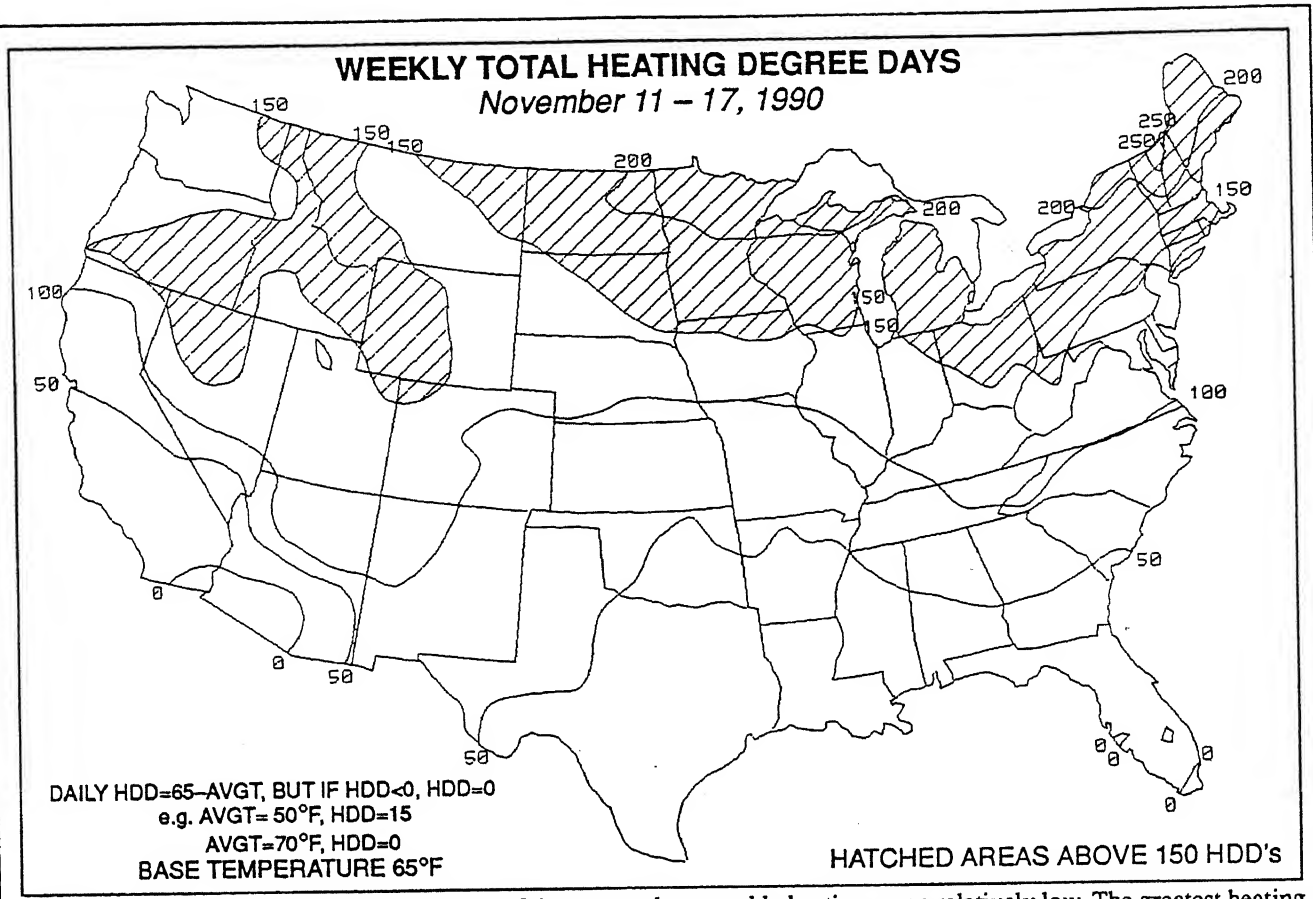
TABLE 3. Selected stations with temperatures averaging 3.0°F or more BELOW normal for the week.

STATION	DEPARTURE (°F)	AVERAGE (°F)	STATION	DEPARTURE (°F)	AVERAGE (°F)
NORTHWAY, AK	-21.6	-22.9	TALKEETNA, AK	-7.6	10.8
GULKANA, AK	-18.9	-10.5	JUNEAU, AK	-7.5	25.4
BIG DELTA, AK	-16.2	-7.6	ILIAMNA, AK	-5.8	18.4
FAIRBANKS, AK	-12.9	-8.1	HOMER, AK	-5.8	23.8
BETTLES, AK	-10.4	-9.1	KOTZEBUE, AK	-4.9	4.2
CORDOVA/MILE 13, AK	-9.9	21.0	MEDFORD, OR	-4.3	39.4
KENAI, AK	-9.5	12.9	MT. WASHINGTON, NH	-4.0	17.1
ANCHORAGE, AK	-9.2	13.4	ROME/GRIFFISS AFB, NY	-3.4	35.8
YAKUTAT, AK	-8.7	24.1	CAPE HATTERAS, NC	-3.3	53.4

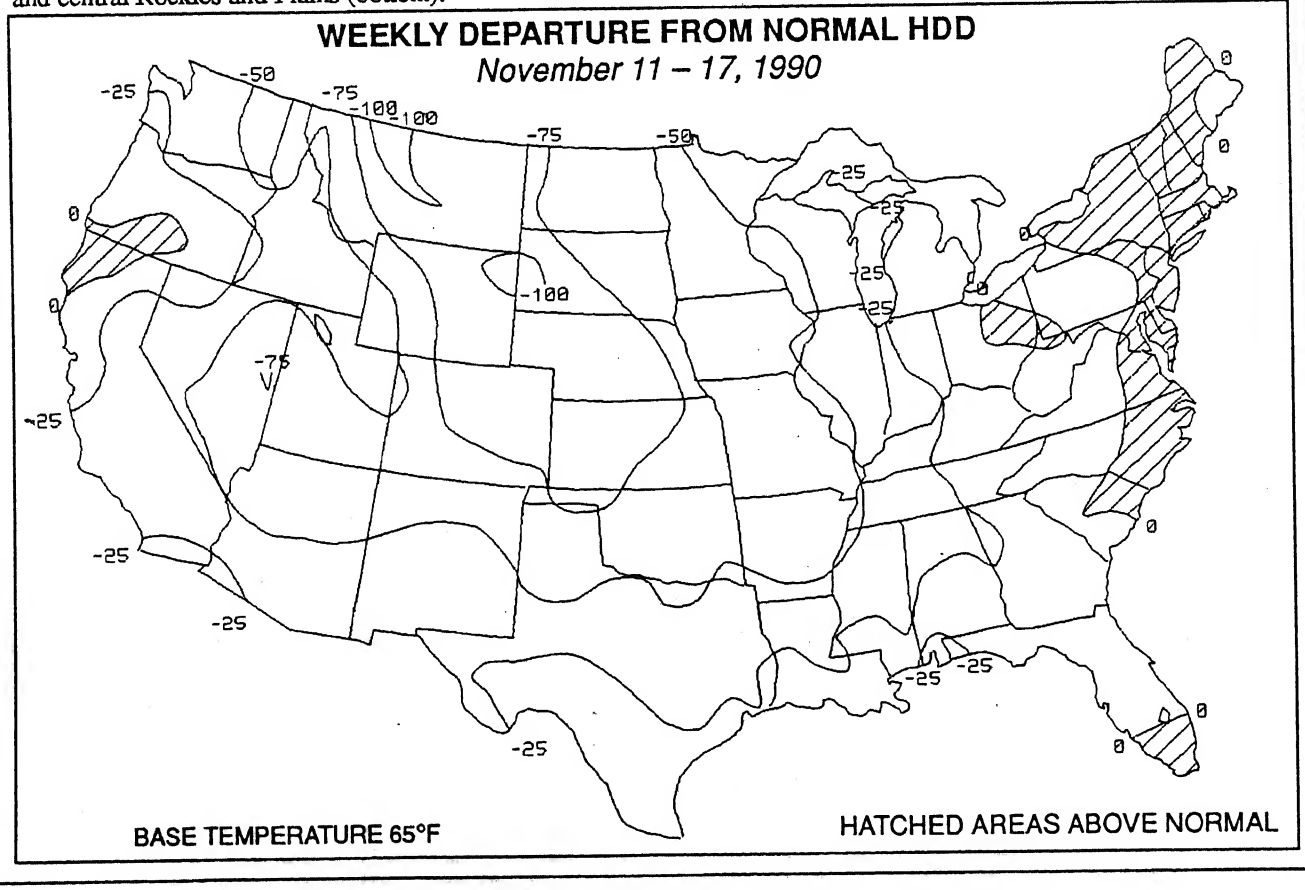


Relatively high minimum temperatures were found across the north–central states as Indian Summer weather covered most of the U.S. Readings in the teens were limited to the central Rockies, Great Basin, upper Midwest, and northern New England (top). Mild conditions kept wind chills generally above 0°F across the northern tier of states except for the upper Midwest and most of New England (bottom)



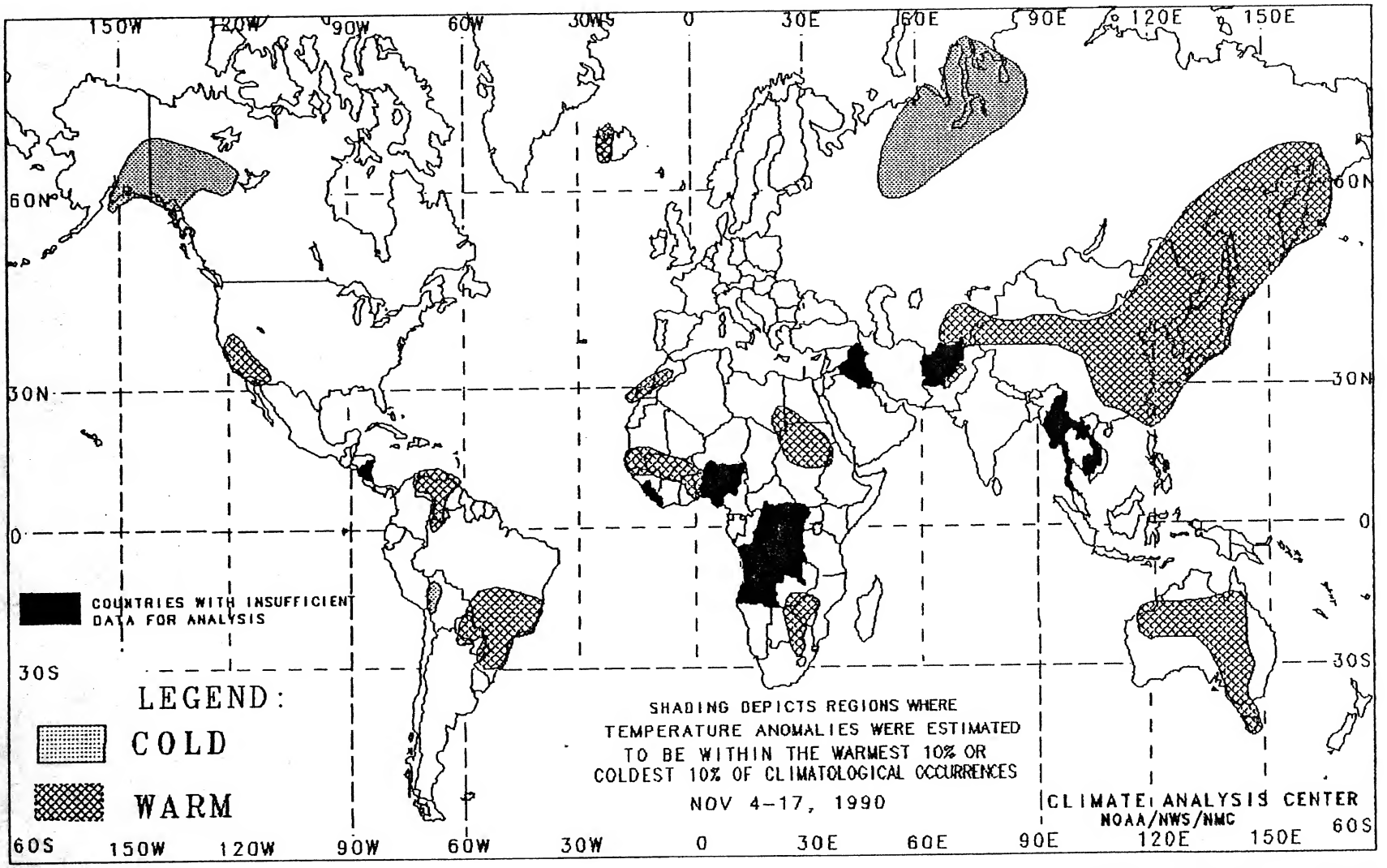


Unseasonably mild weather throughout most of the country kept weekly heating usage relatively low. The greatest heating requirements (>200 HDD's) were confined to the upper Midwest and northern New England (top). With much above normal weekly temperatures, much of the nation experienced well below normal weekly heating demand, especially in the northern and central Rockies and Plains (bottom).



GLOBAL TEMPERATURE ANOMALIES

2 WEEKS



The anomalies on this chart for which at least 13 days of tem reports. Many stations do not ope observations are not taken. As a minimum temperature may have overestimation of the extent of so

Temperature anomalies ar departures from normal exceeds

oximately 2500 observing stations vere received from synoptic ur basis so many night time observations the estimated rn may have resulted in an

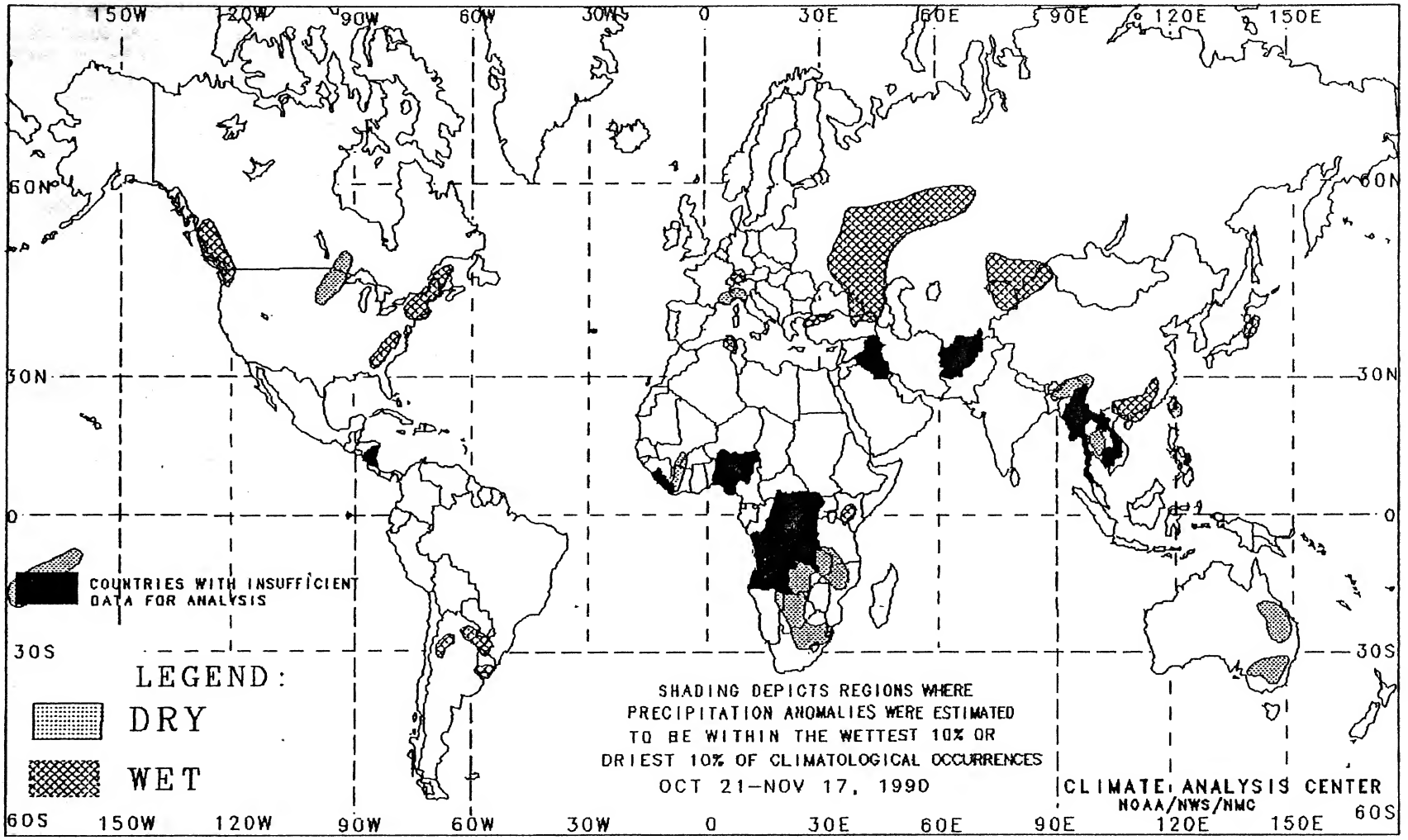
e magnitude of temperature

In some regions, insufficient data exist to determine the magnitude of anomalies. These regions are located in parts of tropical Africa, southwestern Asia, interior equatorial South America, and along the Arctic Coast. Either current data are too sparse or incomplete for analysis, or historical data are insufficient for determining percentiles, or both. No attempt has been made to estimate the magnitude of anomalies in such regions.

This chart shows general areas of two week temperature anomalies. Caution must be used in relating it to local conditions, especially in mountainous regions.

GLOBAL PRECIPITATION ANOMALIES

4 WEEKS



The anomalies on this chart are based on approximately 2500 observing stations for which at least 27 days of precipitation observations (including zero amounts) were received or estimated from synoptic reports. As a result of both missing observations and the use of estimates from synoptic reports (which are conservative), a dry bias in the total precipitation amount may exist for some stations used in this analysis. This in turn may have resulted in an overestimation of the extent of some dry anomalies.

In climatologically arid regions where normal precipitation for the four week period is less than 20 mm, dry anomalies are not depicted. Additionally, wet anomalies for such arid regions are not depicted unless the total four week precipitation exceeds 50 mm.

In some regions, insufficient data exist to determine the magnitude of anomalies. These regions are located in parts of tropical Africa, southwestern Asia, interior equatorial South America, and along the Arctic Coast. Either current data are too sparse or incomplete for analysis, or historical data are insufficient for determining percentiles, or both. No attempt has been made to estimate the magnitude of anomalies in such regions.

The chart shows general areas of four week precipitation anomalies. Caution must be used in relating it to local conditions, especially in mountainous regions.

SPECIAL CLIMATE SUMMARY

EL NIÑO/SOUTHERN OSCILLATION (ENSO) DIAGNOSTIC ADVISORY 90/9

issued by

DIAGNOSTICS BRANCH
CLIMATE ANALYSIS CENTER, NMC

November 13, 1990

Most atmospheric indices in the tropical Pacific indicated near normal conditions during October in spite of anomalously warm sea surface temperatures in the central and western equatorial Pacific (Figure 1). The sea surface temperature (SST) and SST anomaly in the Niño 4 region have increased steadily during the last year, and the October 1990 values were comparable to previous warm episodes (Figure 2). The areal extent of SST's exceeding 30°C increased considerably during the last two months. However, SST anomalies remained close to zero throughout the eastern portion of the equatorial Pacific.

The Southern Oscillation Index (SOI) was near zero for October and low–level (850 mb) winds in the central equatorial Pacific were near normal. Anomalously strong [weak] easterly low–level winds were observed in the western [eastern] equatorial Pacific. Atmospheric convective activity was near normal along the equator in the vicinity of the date line.

The increase in sea surface temperature in the Niño 4 region indicates a continued trend towards warm episode conditions. This index is less noisy than other oceanic and atmospheric indices and has reliably indicated previous warm episodes. Conditions in the central equatorial Pacific will continue to be closely monitored, especially in regards to the development of persistent enhanced atmospheric convection in the region.

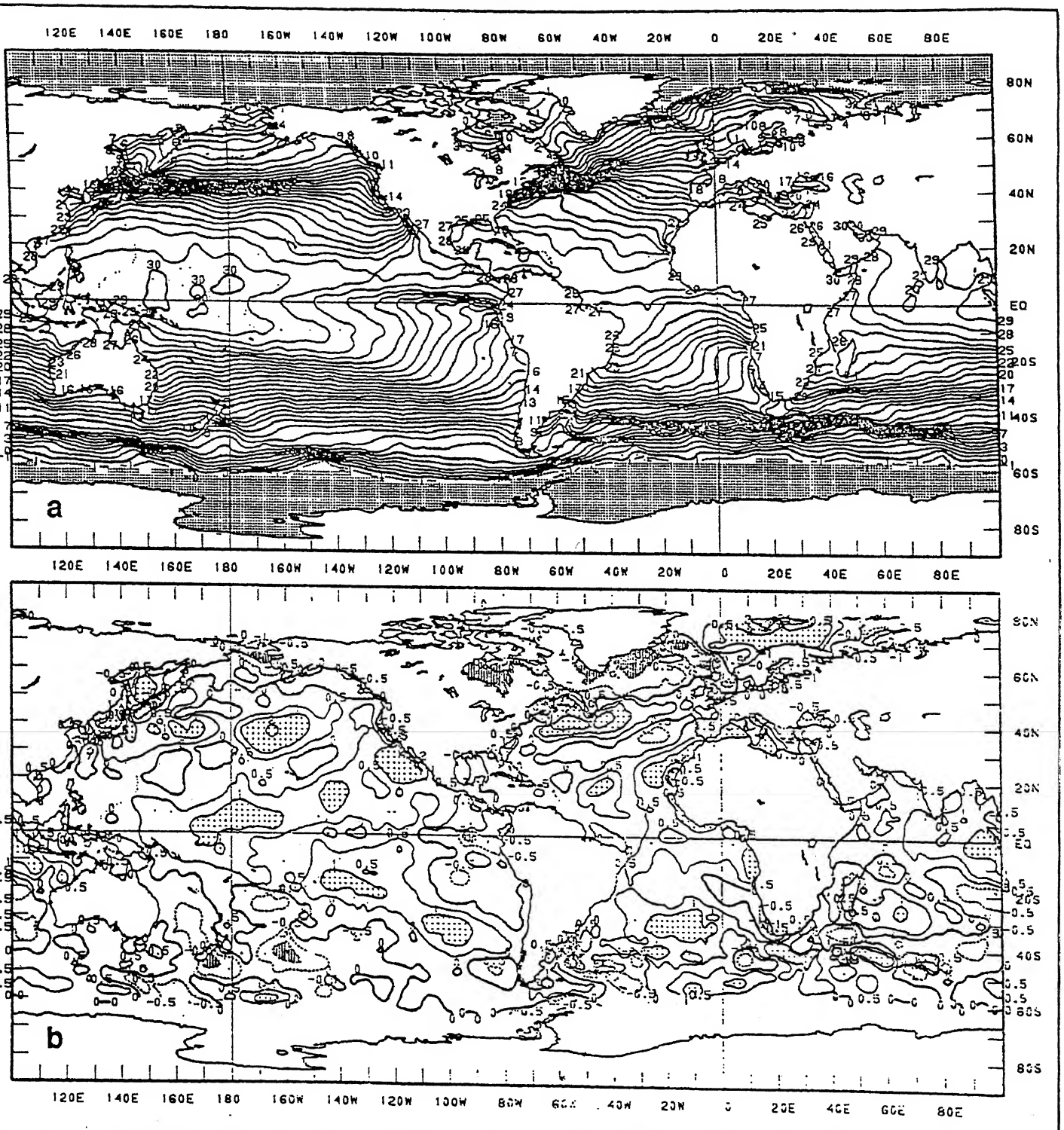
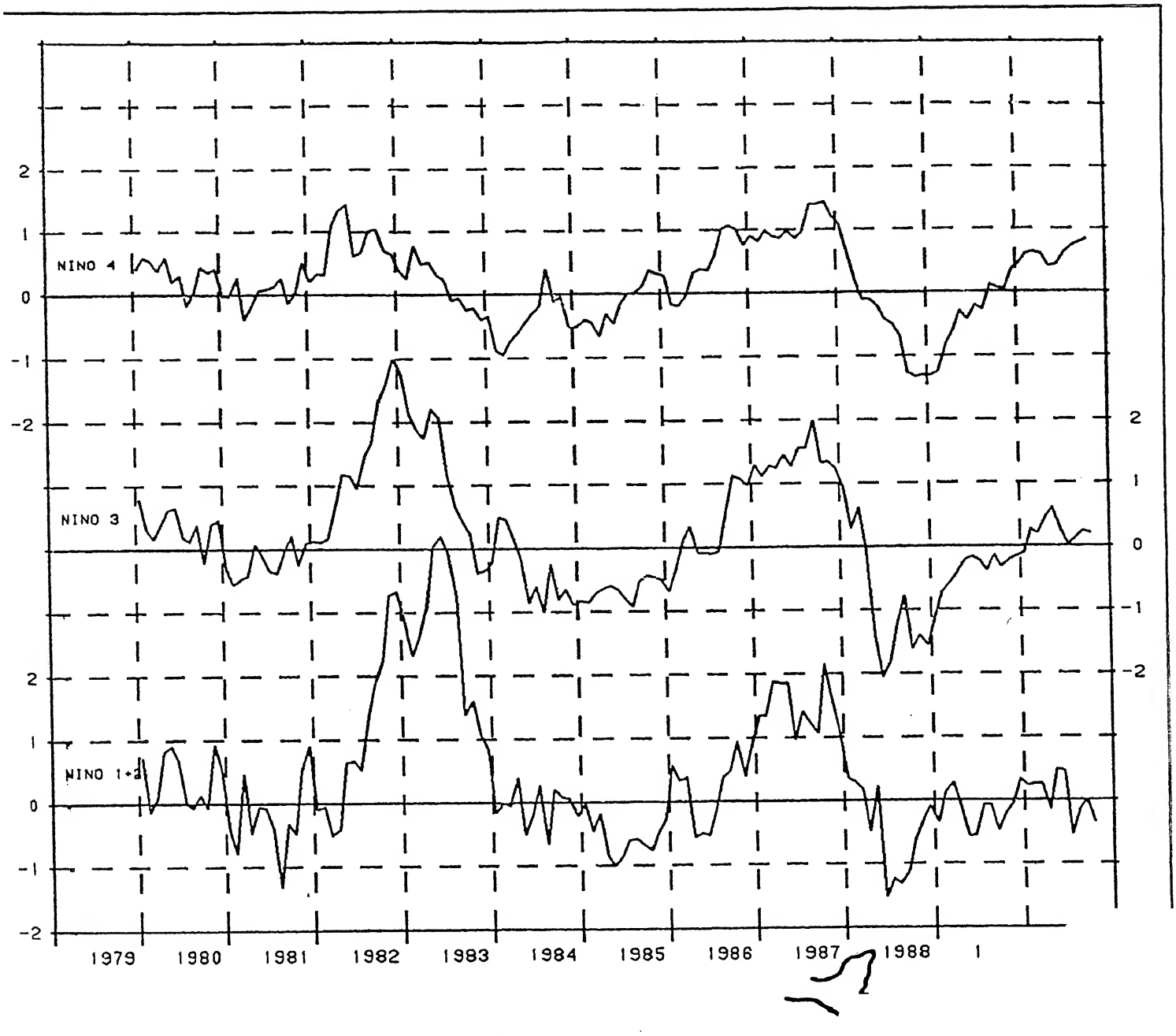


Figure 1. BLENDED SEA SURFACE TEMPERATURE a) mean and b) anomaly for October 1990. The contour interval is 1°C, and negative contours are dashed. Heavy contours are at 0°C and multiples of 5°C. The dotting in a) indicates sea ice cover. In b), anomalies less than -1°C are vertically hatched, and greater than 1°C are dotted. Additional anomaly contours of ± 0.5°C are shown. Anomalies in b) are computed as departures from the COADS/ICE climatology (Reynolds, 1988, J. Clim., 1, 75-86).



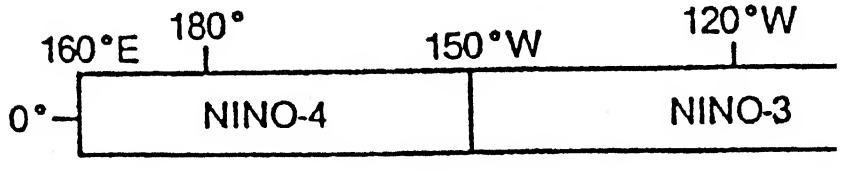
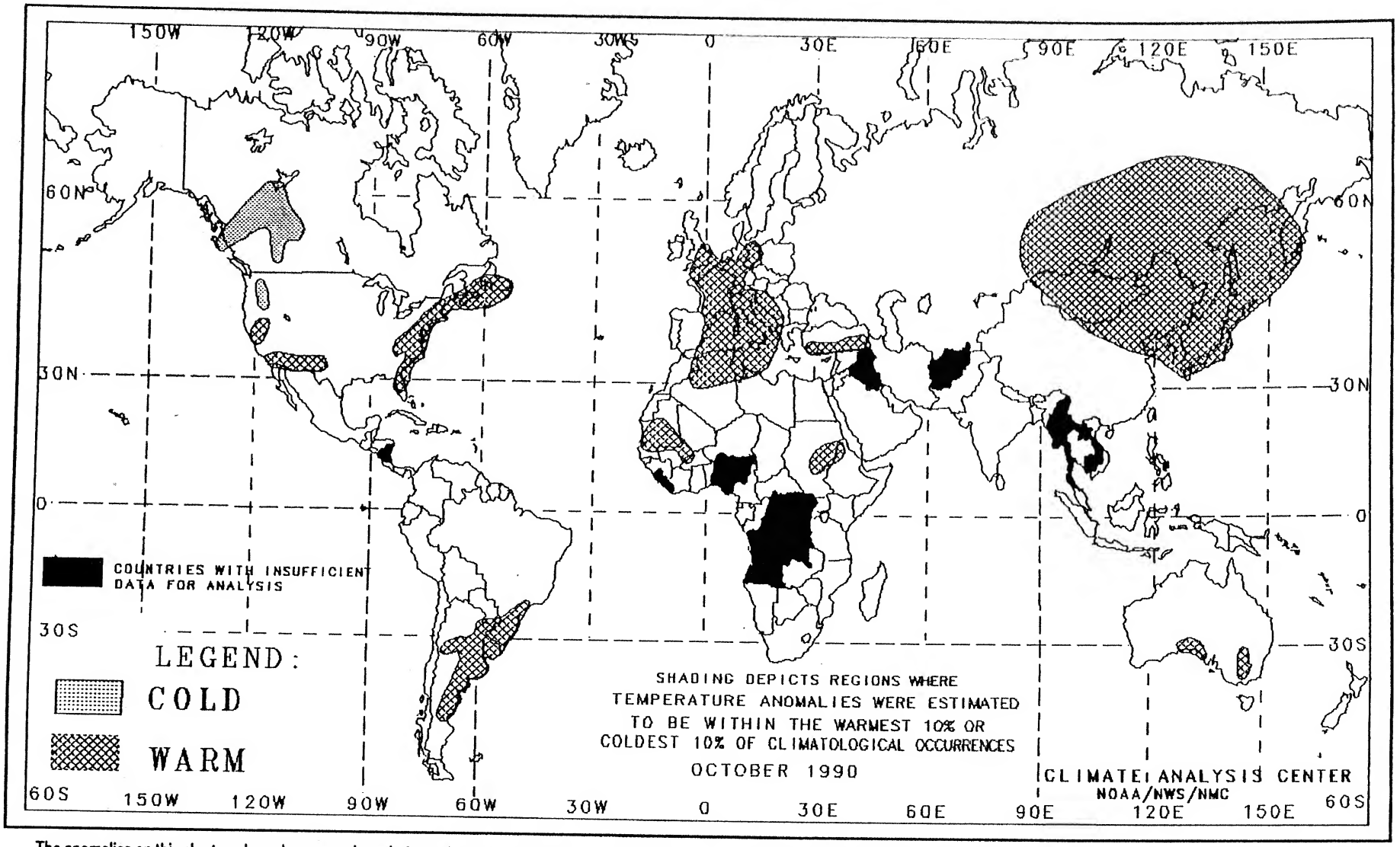


Figure 2. Equatorial Pacific sea surface temperature anomaly indi
bottom of the figure. Nino 1+2 is the average over the Nino
computed with respect to the COADS/ICE climatology (see the
Bulletin or Reynolds, 1988, J. Clim., 1, 75-86)

GLOBAL TEMPERATURE ANOMALIES

OCTOBER 1990



The anomalies on this chart are based on approximately 2500 observing stations for which at least 26 days of temperature observations were received from synoptic reports. Many stations do not operate on a twenty–four hour basis so many night time observations are not taken. As a result of these missing observations the estimated minimum temperature may have a warm bias. This in turn may have reulted in an overestimation of the extent of some warm anomalies.

Temperature anomalies are not depicted unless the magnitude of temperature departures from normal exceeds 1.5°C.

In some regions, insufficient data exist to determine the magnitude of anomalies. These regions are located in parts of tropical Africa, southwestern Asia, interior equatorial South America, and along the Arctic Coast. Either current data are too sparse or incomplete for analysis, or historical data are insufficient for determining percentiles, or both. No attempt has been made to estimate the magnitude of anomalies in such regions.

The chart shows general areas of one month temperature anomalies. Caution must be used in relating it to local conditions, especially in mountainous regions.

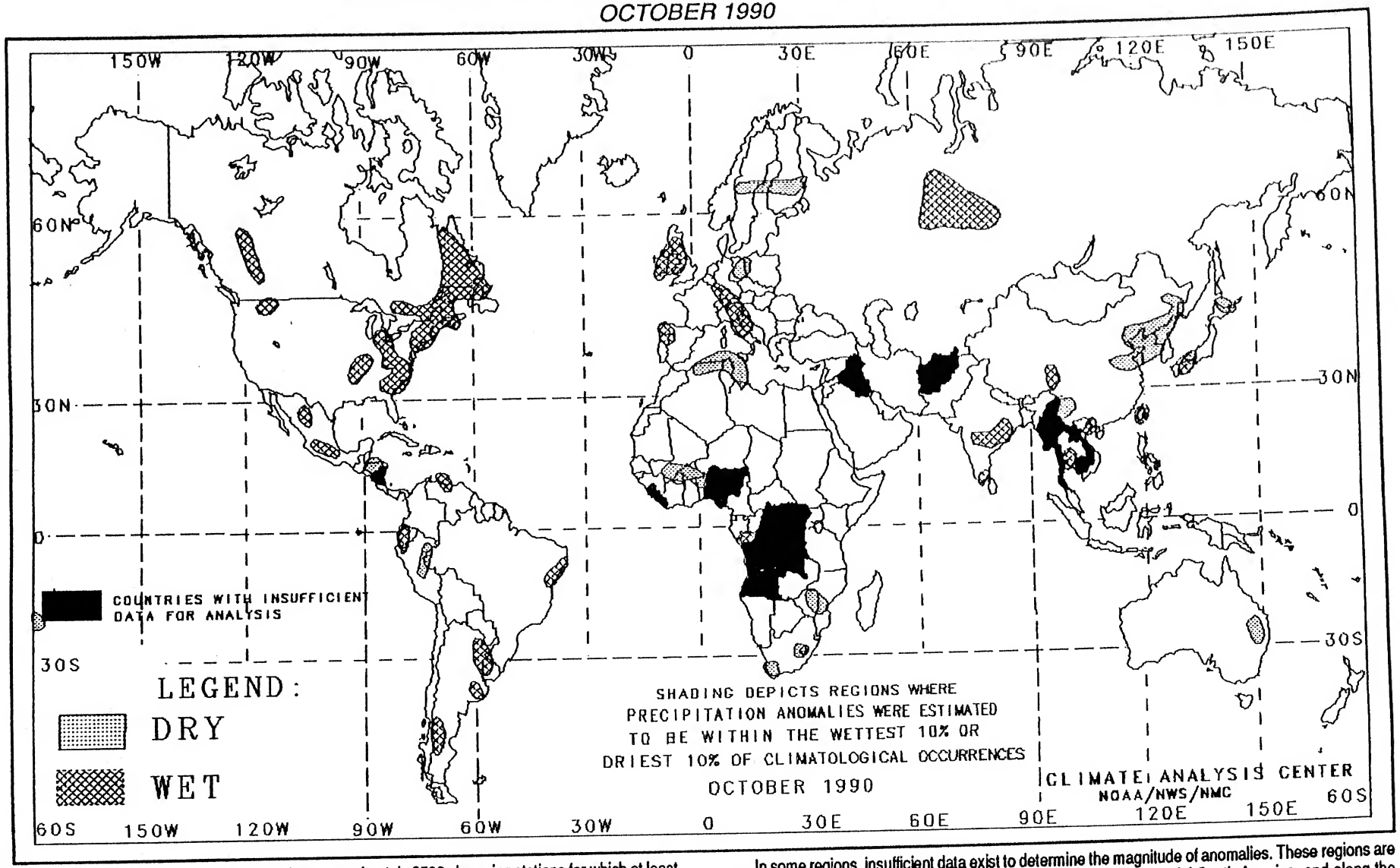
PRINCIPAL TEMPERATURE ANOMALIES

OCTOBER 1990

REGIONS AFFECTED	TEMPERATURE AVERAGE (°C)	DEPARTURE FROM NORMAL (°C)	COMMENTS
NORTH AMERICA			
Western Canada	−2 to +5	−2 to −4	COLD – 2 to 5 weeks
Northwestern United States	+7 to +8	Around −2	COLD – 3 to 4 weeks
Northern California and Western Nevada	+13 to +20	+2 to +3	Very warm late in October
Southwestern United States	+17 to +26	+2 to +3	Very warm second half of October
Eastern United States and Southeastern Canada	+9 to +25	+2 to +3	Very warm first half of October
SOUTH AMERICA AND EASTERN PACIFIC			
Brazil, Uruguay, and Argentina	+15 to +23	+2 to +4	WARM – 2 to 6 weeks
EUROPE AND THE MIDDLE EAST			
Europe	+3 to +23	+2 to +4	WARM – 4 to 18 weeks
Southern Turkey	+12 to +23	Around +2	WARM – 2 to 5 weeks
AFRICA			
Northwestern Africa	+21 to +27	+2 to +5	WARM – 6 to 13 weeks
Western Sahel Region	+30 to +34	+2 to +3	WARM – 4 to 14 weeks
Sudan	+29 to +32	+2 to +3	WARM – 4 to 8 weeks
ASIA			
Eastern Asia	−3 to +20	+2 to +6	WARM – 2 to 18 weeks
AUSTRALIA AND WESTERN PACIFIC			
South Central Australia	+19 to +20	Around +2	Very warm second half of October
Southeastern Australia	+19 to +20	+2 to +3	Very warm second half of October

GLOBAL PRECIPITATION ANOMALIES

OCTOBER 1990



The anomalies on this chart are based on approximately 2500 observing stations for which at least 27 days of precipitation observations (including zero amounts) were received or estimated from synoptic reports. As a result of both missing observations and the use of estimates from synoptic reports (which are conservative), a dry bias in the total precipitation amount may exist for some stations used in this analysis. This in turn may have resulted in an overestimation of the extent of some dry anomalies.

In climatologically arid regions where normal precipitation for the one month period is less than 20 mm, dry anomalies are not depicted. Additionally, wet anomalies for such arid regions are not depicted unless the total one month precipitation exceeds 50 mm.

In some regions, insufficient data exist to determine the magnitude of anomalies. These regions are located in parts of tropical Africa, southwestern Asia, interior equatorial South America, and along the Arctic Coast. Either current data are too sparse or incomplete for analysis, or historical data are insufficient for determining percentiles, or both. No attempt has been made to estimate the magnitude of anomalies in such regions.

The chart shows general areas of one month precipitation anomalies. Caution must be used in relating it to local conditions, especially in mountainous regions.

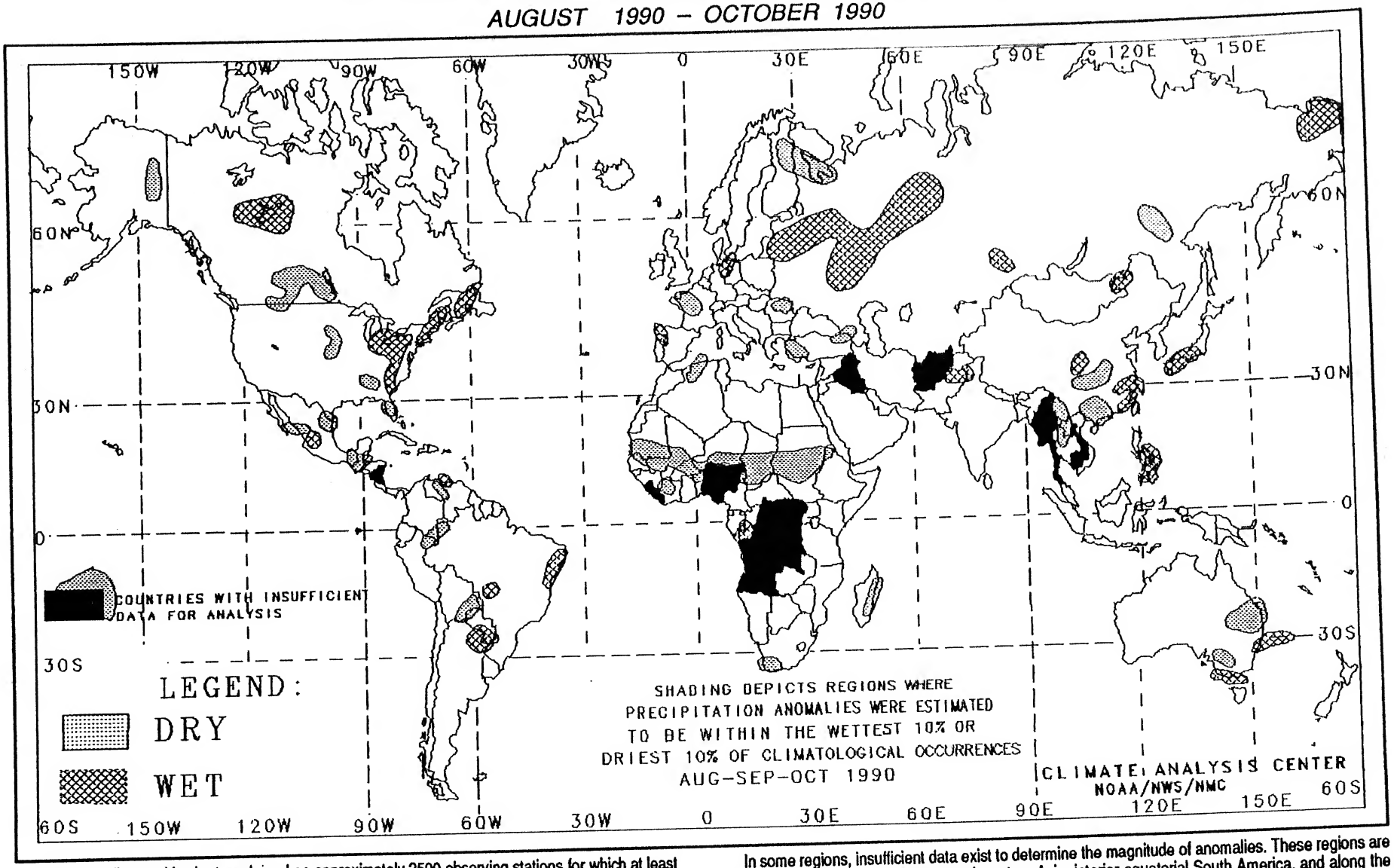
PRINCIPAL PRECIPITATION ANOMALIES

OCTOBER 1990

REGIONS AFFECTED	PRECIPITATION TOTAL (MM)	PERCENT OF NORMAL	COMMENTS
NORTH AMERICA			
Western Alberta	48 to 61	198 to 212	WET – 4 to 5 weeks
Northwestern United States	53 to 78	215 to 287	WET – 4 to 7 weeks
South Central United States	122 to 193	194 to 269	Heavy precipitation first half of October
Midwestern and Southeastern United States	103 to 374	193 to 738	WET – 2 to 10 weeks
Northeastern United States and Southeastern Canada	81 to 344	160 to 299	WET – 2 to 7 weeks
North Central Mexico	96 to 121	218 to 653	Heavy precipitation first half of October
Central Mexico	147 to 292	221 to 418	WET – 4 to 10 weeks
Honduras	73 to 122	17 to 31	DRY – 6 weeks
SOUTH AMERICA AND EASTERN PACIFIC			
North Central Venezuela	223 to 237	180 to 332	WET – 2 to 10 weeks
Ecuador	221 to 398	Around 179	Heavy precipitation first half of October
East Central Peru	45 to 65	26 to 28	DRY – 6 to 9 weeks
Extreme Eastern Brazil	74 to 399	208 to 386	WET – 10 weeks
Uruguay and Northeastern Argentina	273 to 359	188 to 263	WET – 2 to 8 weeks
East Central Argentina	173 to 195	216 to 294	Heavy precipitation first half of October
Southwestern Argentina	Around 61	Around 234	Heavy precipitation first half of October
Fiji Islands	10 to 18	8 to 13	DRY – 6 to 10 weeks
EUROPE AND THE MIDDLE EAST			
Central Scandinavia	11 to 23	25 to 45	DRY – 4 to 11 weeks
Eastern Germany and Western Poland	9 to 10	23 to 24	DRY – 6 weeks
South Central Europe	121 to 236	202 to 302	WET – 2 to 8 weeks
British Isles	111 to 252	161 to 241	WET – 2 to 5 weeks
Northwestern Spain and Northern Portugal	284 to 431	233 to 353	WET – 10 weeks
AFRICA			
North Central Africa	0 to 10	0 to 23	DRY – 10 to 14 weeks
Central Sahel	4 to 30	9 to 23	DRY – 5 to 6 weeks
Congo	215 to 306	190 to 236	WET – 4 to 6 weeks
Zimbabwe	1 to 8	3 to 14	DRY – 6 to 10 weeks
Southeastern South Africa	0 to 6	0 to 14	DRY – 10 to 14 weeks
Southwestern South Africa	2 to 8	6 to 44	DRY – 10 weeks
ASIA			
West Central Siberia	65 to 104	159 to 267	WET – 4 to 8 weeks
Central India	159 to 404	201 to 651	Heavy precipitation first half of October
Southeastern India	Around 463	Around 166	Heavy precipitation second half of October
South Central Thailand	401 to 550	184 to 252	WET – 4 weeks
South Central China	Around 272	Around 439	WET – 9 weeks
Southwestern China	22 to 44	27 to 40	DRY – 6 weeks
Central China	64 to 71	238 to 267	Heavy precipitation first half of October
Taiwan	0 to 2	0 to 4	DRY – 7 to 9 weeks
Eastern China and Northern Korea	0 to 10	0 to 34	DRY – 5 to 10 weeks
Southern Japan	198 to 276	167 to 205	Heavy precipitation first half of October
Northern Japan	29 to 60	30 to 48	DRY – 5 weeks
AUSTRALIA AND WESTERN PACIFIC			
East Central Australia	9 to 12	21 to 23	DRY – 10 weeks

GLOBAL PRECIPITATION ANOMALIES

AUGUST 1990 – OCTOBER 1990

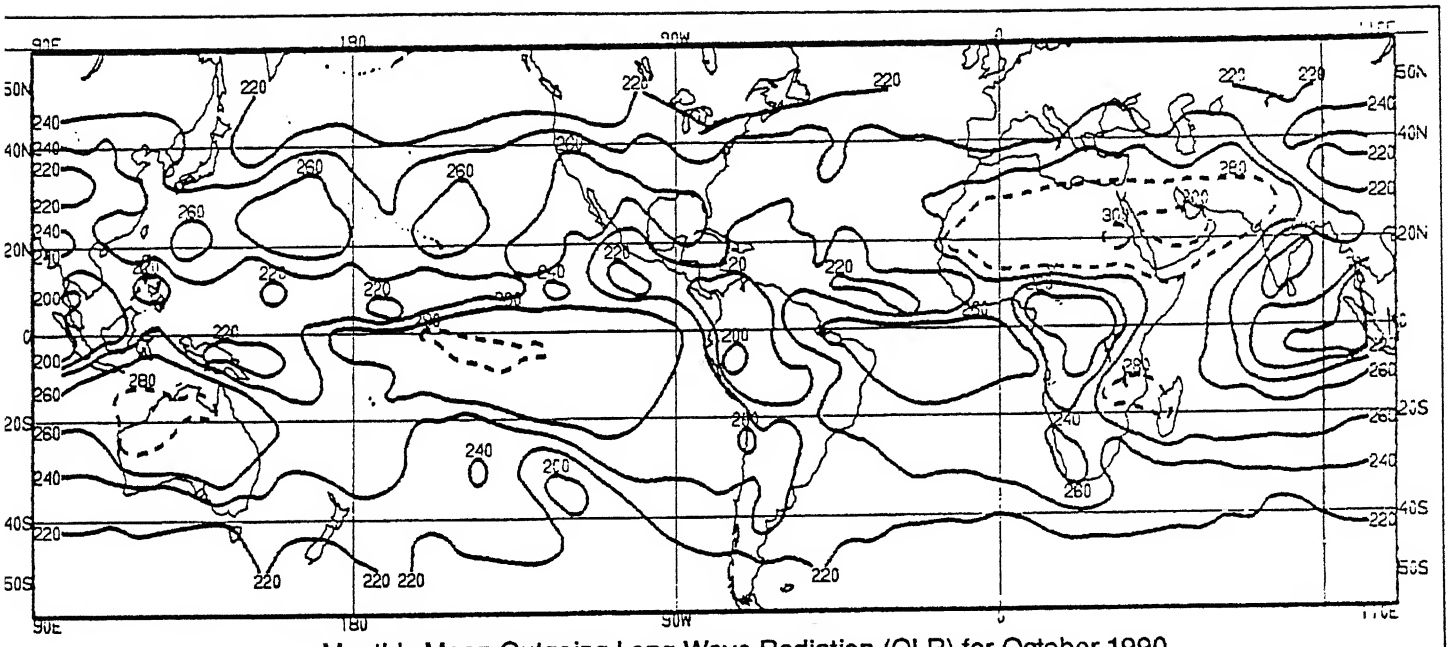


The anomalies on this chart are based on approximately 2500 observing stations for which at least 81 days of precipitation observations (including zero amounts) were received or estimated from synoptic reports. As a result of both missing observations and the use of estimates from synoptic reports (which are conservative), a dry bias in the total precipitation amount may exist for some stations used in this analysis. This in turn may have resulted in an overestimation of the extent of some dry anomalies.

In climatologically arid regions where normal precipitation for the three month period is less than 50 mm, dry anomalies are not depicted. Additionally, wet anomalies for such arid regions are not depicted unless the total three month precipitation exceeds 125 mm.

In some regions, insufficient data exist to determine the magnitude of anomalies. These regions are located in parts of tropical Africa, southwestern Asia, interior equatorial South America, and along the Arctic Coast. Either current data are too sparse or incomplete for analysis, or historical data are insufficient for determining percentiles, or both. No attempt has been made to estimate the magnitude of anomalies in such regions.

The chart shows general areas of three month precipitation anomalies. Caution must be used in relating it to local conditions, especially in mountainous regions.

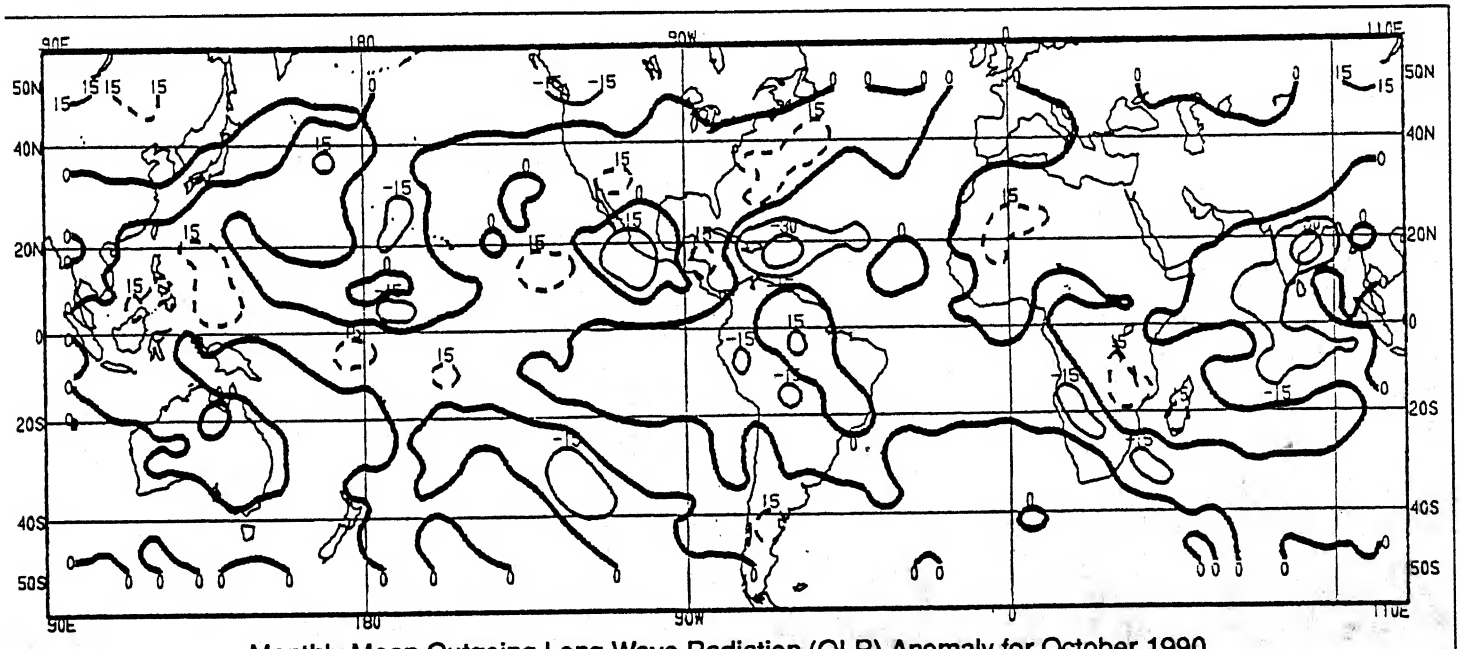


Monthly Mean Outgoing Long Wave Radiation (OLR) for October 1990

EXPLANATION

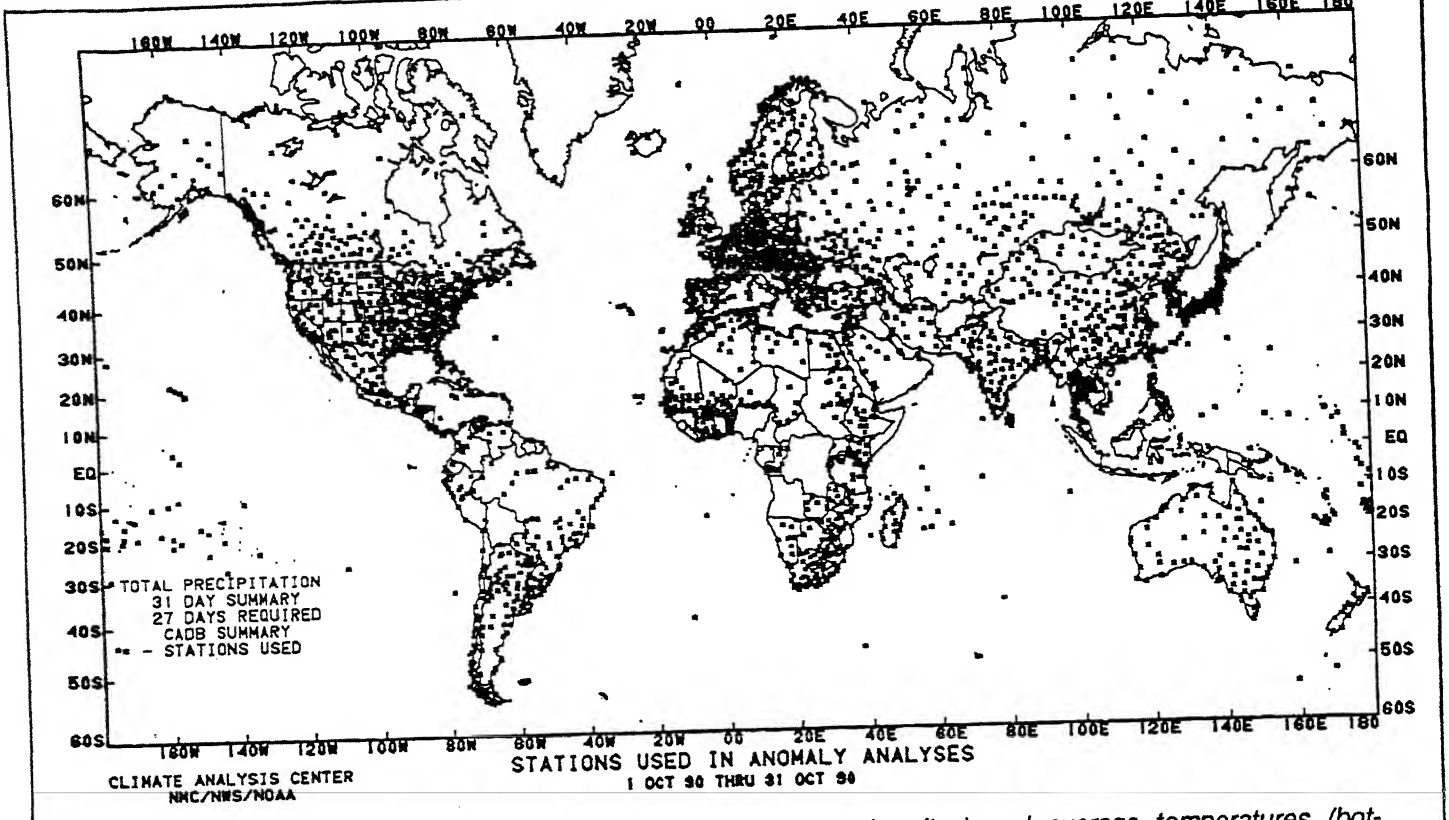
The mean monthly outgoing long wave radiation (OLR) as measured by the NOAA–9 AVHRR IR window channel by NESDIS/SRL (top). Data are accumulated and averaged over 2.5° areas to a 5° Mercator grid for display. Contour intervals are 20 Wm^{-2}, and contours of 280 Wm^{-2} and above are dashed. In tropical areas (for our purposes 20°N – 20°S) that receive primarily convective rainfall, a mean OLR value of less than 200 Wm^{-2} is associated with significant monthly precipitation, whereas a value greater than 260 Wm^{-2} normally indicates little or no precipitation. Care must be used in interpreting this chart at higher latitudes, where much of the precipitation is non–convective, or in some tropical coastal or island locations, where precipitation is primarily orographically induced. The approximate relationship between mean OLR and precipitation amount does not necessarily hold in such locations.

The mean monthly outgoing long wave radiation anomalies (bottom) are computed as departures from the 1979 – 1988 base period mean. Contour intervals are 15 Wm^{-2}, while positive anomalies (greater than normal OLR, suggesting less than normal cloud cover and/or precipitation) are dashed and negative anomalies (less than normal OLR, suggesting greater than normal cloud cover and/or precipitation) are solid.



Monthly Mean Outgoing Long Wave Radiation (OLR) Anomaly for October 1990

STATIONS USED IN THE MONTHLY ANOMALY ANALYSES (OCTOBER 199(



Stations used in the anomaly analyses for total precipitation (top) and average temperatures (bottom) during October 1990. 27 [26] days were required for inclusion in the monthly total precipitation [average temperature] anomaly analyses. There were no or incomplete data receipts for some countries in Africa, the Middle East, and Southeast Asia.